

TWO NEW SPECIES OF CECIDOMYIIDAE (DIPTERA) FROM  
HONEYLOCUST, *GLEDITSIA TRIACANTHOS* L. (FABACEAE), IN  
EASTERN UNITED STATES

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*Abstract.*—Two new species of Cecidomyiidae (Cecidomyiinae: supertribe Lasiopteridi) on honeylocust, *Gleditsia triacanthos* L. (Fabaceae), in eastern United States are described: *Meunieriella aquilonia* Gagné from spot galls on leaflets and *Neolasioptera brevis* Gagné from swollen twigs. Biological observations on both species are reported. *M. aquilonia* is the first record of its genus north of El Salvador.

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Arthropods in increasing variety are being shown to damage honeylocust, *Gleditsia triacanthos* L. (Fabaceae), a tree species once considered relatively pest free. The mimosa webworm (Webster and St. George, 1947), the honeylocust pod gall midge (Schread, 1959), a honeylocust spider mite (English and Snetsinger, 1957), and the honeylocust plant bug (Wheeler and Henry, 1976) cause heavy damage. In 1982-83 two new species of Cecidomyiidae (Cecidomyiinae: supertribe Lasiopteridi: subtribe Alycaulina) were collected and reared from native and ornamental honeylocust in Pennsylvania, bringing to three, with *Dasineura gleditchiae* (Osten Sacken), the number of gall midges associated with the tree.

The two new species of Cecidomyiidae are described in this paper. One of them, *Neolasioptera brevis* Gagné, was noticed previously but was listed only as an undescribed species of *Neolasioptera* (Felt 1911, 1940). It causes twig swellings and usually prevents further growth beyond the galls. This species is univoltine, and adults emerge in early spring from the previous year's galls. We have no data to indicate its effect on honeylocust, but a heavy infestation could result in terminal dieback and affect the appearance of a tree.

The other new species, *Meunieriella aquilonia* Gagné, forms a spot gall on leaflets and is especially interesting because it is the first species of the large genus *Meunieriella* reported north of El Salvador. Further, unlike all its congeners which live asinquilines in galls formed by other cecidomyiids, this species forms its own galls. *Meunieriella aquilonia* appears at least by late spring and is multivoltine. We are uncertain of its economic status, largely because we became aware of this species only in 1982. The sudden and widespread appearance of this gall midge in central Pennsylvania is rather interesting considering that Pennsylvania Department of Agriculture (PDA) plant inspectors examine nursery stock annually

in the State and that PDA entomologists have collected extensively on honeylocust since 1975. Leaf drop resulting from this fly appears negligible. Most spot galls are small and the necrosis produced remains confined to the gall and its perimeter.

*Neolasioptera brevis* Gagné, NEW SPECIES

Figs. 1-5

Scale color pattern of dried specimens.—Dorsoposterior surface of head dirty white; anterior corners of scutum, hind edge of scutellum, and pleura white; remainder of scutum and scutellum dirty white; leading edge of wing dark brown except white at base of C and at juncture of C and R5; legs dark except white on coxae and apices of femora and tibiae; abdominal tergum 1 white, terga 3-6 mostly black with white apically, pleura black, sterna white.

Head.—Eye bridge about 6 facets long. Antennae: those of ♂ lost; ♀ with 23-26 flagellomeres, each slightly wider than long. Frontoclypeus with mixed setae and scales. Palpi 4-segmented. Labella hemispherical in frontal view.

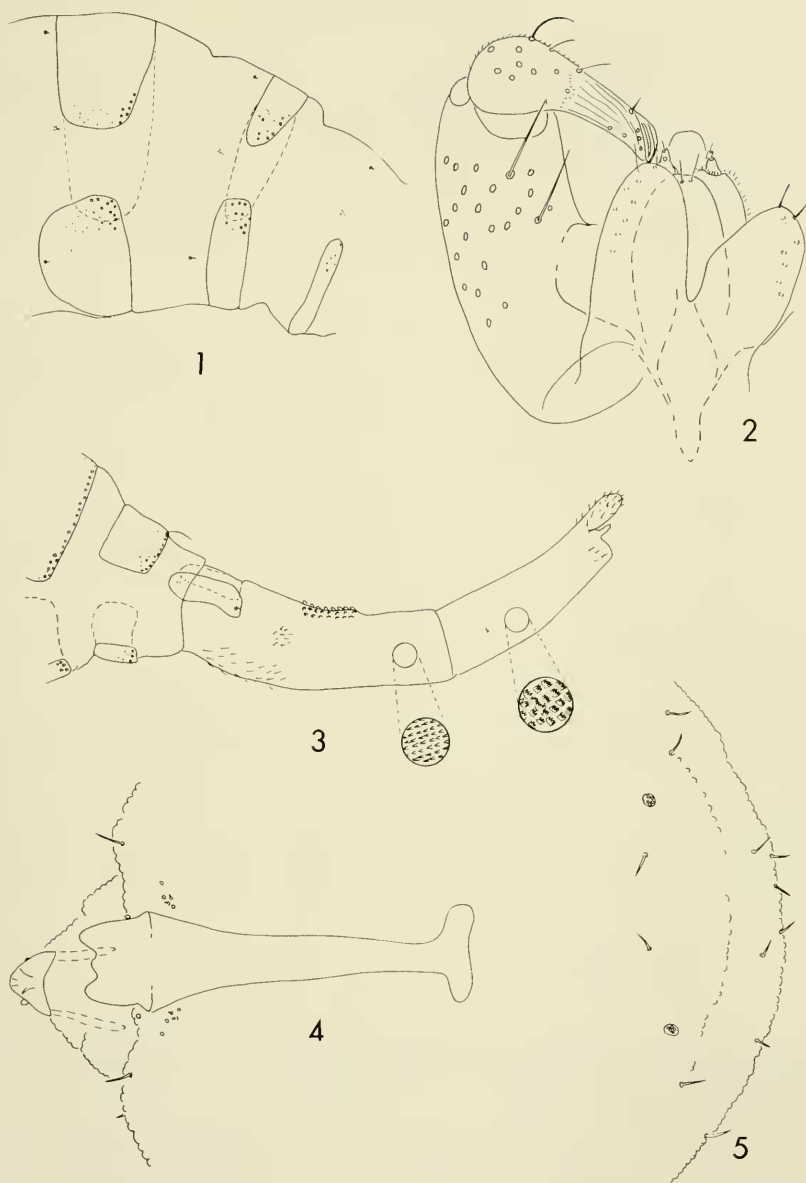
Thorax.—Scutum with scales covering surface except anterolaterally between lateral and dorsocentral setal rows, posteriorly just lateral to dorsocentral setal row, and anteromesally and posteromesally. Anepisternum with scales on top half only. Anepimeron with vertical row of setae and a few intermixed scales. Katepisternum with a few scales ventrally. Wing: ♂, 2.0 mm; ♀, 2.0 mm; R5 attaining 0.55 length wing.

Male abdomen (Figs. 1-2).—Tergites 1-6 rectangular, very wide, with 1 row of caudal setae, 0 lateral setae, a basal pair of trichoid sensilla on cephalic margin (except on tergite 6 on which they are placed just anterior to margin), and elsewhere covered with scales. Tergite 7 less than half as long as preceding, vestiture as for tergite 6 except pair of trichoid sensilla much anterior to sclerite. Tergite 8 not evident except for trichoid sensilla. Sternites 2-6 square, less strongly sclerotized in center than elsewhere, with about 2 rows of caudal setae, a horizontal group of setae at midlength, 1 or 2 basal trichoid sensilla (closely approximated if 2), and elsewhere covered with scales. Sternite 7 very short, with 2 rows of caudal setae and several scales, and 1 trichoid sensillum somewhat cephalad of sclerite. Sternite 8 very short, with 2 rows of caudal setae, trichoid sensilla not evident. Terminalia as in Fig. 2.

Female abdomen (Fig. 3).—Tergites 1-6 and sternites 2-6 as for male, but tergite 6 with trichoid sensilla situated on sclerite and all sternites with 2 trichoid sensilla. Tergite 7 much narrower and shorter than tergite 6, with vestiture only on posterior ½ except for 2 basal, trichoid sensilla. Tergite 9 weakly divided into 2 long tergites, with 2-4, short, caudal setae and subbasal pair of trichoid sensilla. Sternite 7 as for 6. Sternite 8 shorter than sternite 7, vestiture on posterior ⅔ except for basal trichoid sensilla. Length of tergites 6-8 (from trichoid sensilla to posteriormost setae) and distal half ovipositor as 32-18-20-82. Cerci ovoid.

Larva (Figs. 4-5).—Length, 3.0-3.5 mm. Spatula robust, tridentate. Integument pebbled. Full complement of Alycaulina papillae present except for loss of 2 terminal papillae.

Holotype, ♀, ex twig gall on 'Sunburst' honeylocust, *Gleditsia triacanthos* L., coll. 30-III-1983, emerged 12-IV-1983, E. Harrisburg Cemetery, Harrisburg, Dauphin Co., Pa., K. R. Valley, deposited in U.S. National Museum of Natural History, Washington, D.C. Paratypes (all ex twig galls on native *Gleditsia tria-*



Figs. 1-5. *Neolasioptera brevis*. 1, Male abdominal segments 6-8 (ventrolateral). 2, Male terminalia. 3, Female postabdomen. 4, Larva, anterior (ventral). 5, Larva, posterior (dorsal).

*canthos*; one ♀ and one ♂ deposited in the Pennsylvania Department of Agriculture Collection, Harrisburg, the remainder in USNMNH); 2 larvae, collected 14 March 1983, and ♂, ♀, emerged 25 and 28 March 1983, respectively, Mid. Paxton Township, Rt. 225, 0.4 mi N. Clark Creek, Dauphin Co., Pa.; ♀, same data except emerged 4 May 1983 from galls collected 29 April 1983; ♂, 5 ♀, emerged 6 April 1976, Warren Co., Ohio, R. L. Powell and K. Roach. Other specimens in poor

condition: 3 ♀, em 22-IV-1882, Kirkwood, Mo. These last were probably the basis for the records in Felt (1911, 1940).

*Neolasioptera brevis* somewhat resembles but is distinct from *Neolasioptera cassiae* (Felt), also reared from a caesalpinaceous plant, *Cassia nictitans* L. (Fabaceae), in Arizona. The female could be mistaken for *N. brevis*, except that the ovipositor is slightly shorter. The males of the 2 species are distinct: tergites 6 and 7 of *brevis* are very different in size; those of *cassiae* are of equal length and breadth. Also, male *cassiae* have longer gonostyli and a bilobed instead of simple hypoproct. The new species is named *brevis* for the shortened sclerites of male abdominal segments 7 and 8.

Irregular twig swellings of about twice the normal diameter were first noticed by one of us (KV) on 2-VIII-1982 in Dauphin Co., Pa. Galls then contained second instars of cecidomyiid larvae assumed to belong to *Neolasioptera*. Because most neolasiopteras are univoltine and overwinter in the galls, the remaining galls were left on the trees until mid-March, 1983. Galls were found on ornamental 'Sunburst' honeylocust and on wild specimens. Inside the galls were short tunnels about 6 mm long, each usually aligned with the long axis of the twig, but curved slightly at the exit, which was covered either by a thin outermost layer of plant epidermis or particulate matter that appeared to be stuck together by webbing. The latter tunnels produced *N. brevis* adults and parasitic wasps; the tunnels with ends covered by the thin layer of epidermal tissue produced only wasps. In mid-March the tunnels contained full grown cecidomyiid larvae or hymenopterous larvae, or were apparently empty. A dead, shriveled second instar of *N. brevis* was found in one of the apparently empty but closed tunnels. Several adult *N. brevis* were reared in March and April as were many parasitic Hymenoptera belonging to 3 species: a *Platygaster* sp. (Platygastriidae), evidently an internal parasite of *N. brevis* because it emerged from tunnels containing empty but still inflated *N. brevis* larval skins; a *Eurytoma* sp. (Eurytomidae), from tunnels with deflated, crumpled *N. brevis* skins; and a *Pediobius* sp. (Eulophidae).

### *Meunieriella aquilonia* Gagné, NEW SPECIES

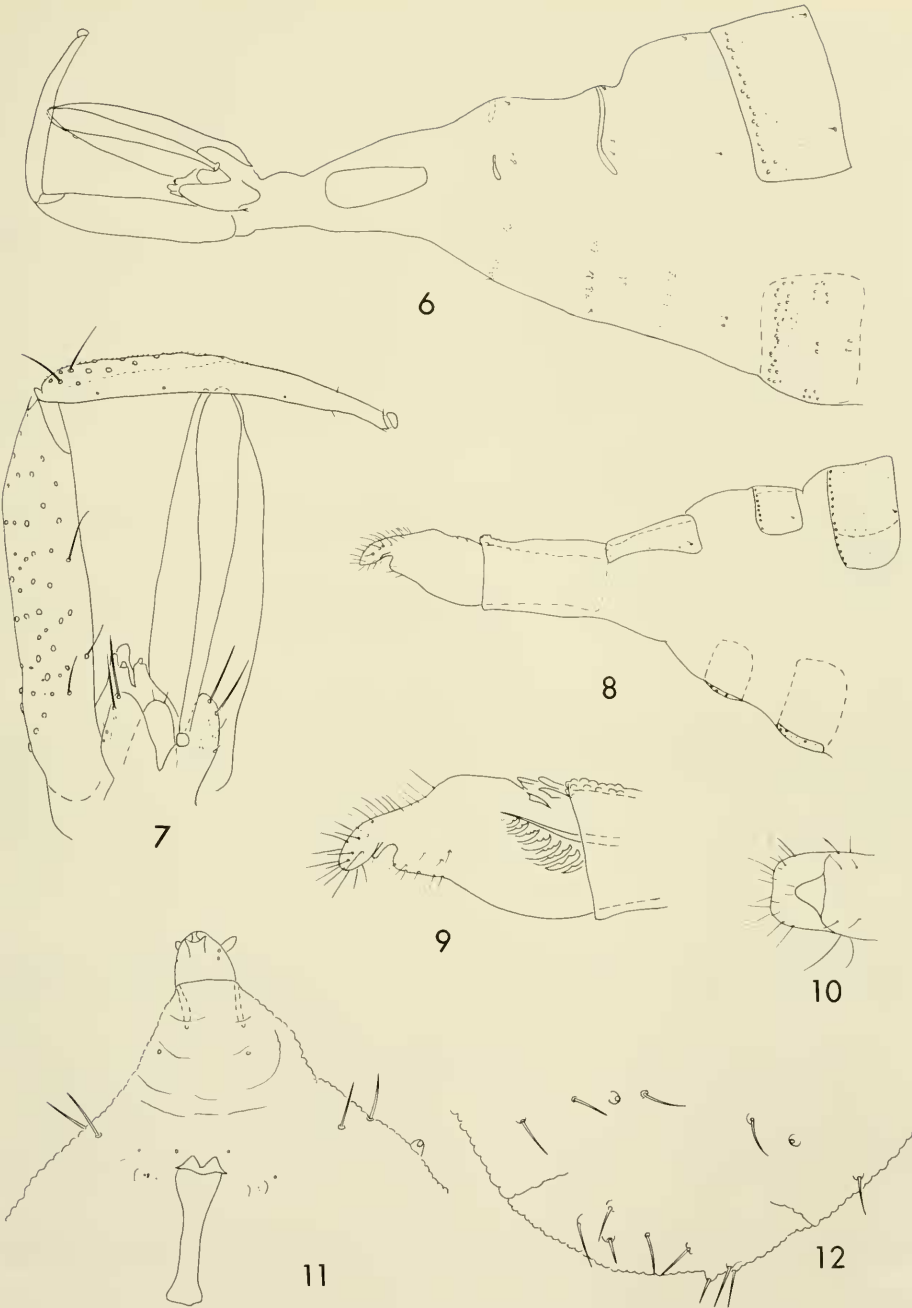
Figs. 6-12

Scale color pattern of dried specimens.—Dorsoposterior surface of head and thorax golden brown, lateroposterior surface of head white, leading edge of wing all dark brown, legs yellow except for brown tarsi, abdomen brown.

Head.—Eye bridge about 6 facets long. Antennae: ♂ with 20 flagellomeres, each about as wide as long; ♀ with 21-23 flagellomeres, each slightly wider than long. Frontoclypeus with mixed setae and scales. Palpi 4-segmented. Labella short, hemispherical in frontal view.

Thorax.—Scutum with scales covering surface except anterolaterally between the lateral and dorsocentral setal rows, posteriorly just laterad of dorsocentral setal row, and anteromesally and posteromesally. Anepisternum with scales on top half only. Anepimeron with vertical row of setae and 0 scales. Katepisternum bare. Wing: ♂, 1.3 mm; ♀, 1.2-1.3 mm; R5 attaining 0.50 length wing.

Male abdomen (Figs. 6-7).—Tergites 1-5 rectangular with a single row of caudal setae, 0 lateral setae, 2 basal trichoid sensilla, and covered elsewhere with scales. Sternites 2-5 rectangular, with a single row of caudal setae on sternites 2-4, and a double row on sternite 5, these sternites with a discontinuous horizontal row



Figs. 6-12. *Meunieriella aquilonia*. 6, Male posterior abdominal segments (dorsolateral). 7, Male terminalia (dorsal). 8, Female postabdomen (lateral). 9, Ovipositor (lateral). 10, Cercus and hypoproct (ventral). 11, Larva, anterior (ventral). 12, Larva, posterior (dorsal).



of setae at midlength, a basal pair of closely approximated trichoid sensilla and elsewhere covered with scales, these less numerous just anterior of caudal setal row. Segments 6–8 weakly sclerotized, tergites and sternites evident only by slight sclerotization anteriorly and by presence of 2 basal, trichoid sensilla on each tergite and sternite. Segment 9 with rhomboid sclerotized area anterior to terminalia. Terminalia as in Fig. 7.

Female abdomen (Figs. 8–10).—Tergites 1–6 and sternites 2–5 as for tergites 1–5 and sternites 2–5 of male. Tergite 7 much smaller than tergite 6, with vestiture only on posterior half except for basal trichoid sensilla. Tergal area between tergites 7 and 8 slightly sclerotized, tergite 8 longer and narrower than 7, with basal trichoid sensilla and a few, short setae laterally and posteriorly, sternite 7 smaller than 6, vestiture concentrated posteriorly. Lengths of tergites 6–8 (from trichoid sensilla to caudal setae) and distal half of ovipositor about as 20-12-24-73. Ovipositor: setulae on distal half of ovipositor very large laterally and dorsally; cerci short, flattened dorsoventrally, blunt-tipped.

Larva (Figs. 11–12).—Length, 2.3 mm. Spatula clove-shaped. Integument pebbled except spinulose anteroventrally on abdominal segments. Full complement of Alycaulina papillae present.

Holotype, ♀, from larva ex *Gleditsia triacanthos* leaf blister gall collected 15-VII-1982, emerged 30 July 1982, 0.4 mi. N. Clark Creek, Rt. 225, Mid. Paxt. Township, Dauphin Co., Pa., K. Valley, deposited in U.S. National Museum of Natural History, Washington, D.C. Paratypes (all associated with leaf spot galls on *G. triacanthos*; 2 ♀ and a ♂ deposited in the Pennsylvania Department of Agriculture Collection, Harrisburg, the remainder in USNMNH): 1 larva, same pertinent data as holotype; ♀, same data as holotype; ♂, 2 ♀, collected 2-VIII-1982, emerged 16–17-VIII-1982; ♀, collected 7-VII-1982, emerged 23-VII-1982; ♀, collected 15-VII-1982, emerged 1-VIII-1982; ♂ collected 5-VIII-1982, emerged 16-VIII-1982, E. Harrisburg Cemetery, Harrisburg, Dauphin Co., Pa.; ♀, emerged 25-VIII-1983, its larva collected 11-VIII-1983, Pt. Matilda, Centre Co., Pa.

*M. aquilonia* is the first published record of *Meunieriella* north of El Salvador, thus the specific name, an adjective meaning “northern.” Two males in the USNMNH of a different, undescribed species were caught in a Malaise trap in eastern Maryland. They are generally similar to *aquilonia* but their gonocoxites are more robust. Three species are known from Brazil (Gagné, 1968, under *Dolicholabis*), 12 from El Salvador (Möhn, 1975), and 3 from Colombia (Wünsch, 1979). All those species are inquiline in galls caused by a variety of other cecidomyiids. The difficulty in further comparing the new species with those previously described is that many abdominal details noted and illustrated here for *aquilonia* are undescribed in the others. The claspettes and aedeagus of *aquilonia* are shorter in relation to gonopod length than those illustrated for the neotropical species.

The genus *Meunieriella* was not included in the key to Nearctic genera of Cecidomyiidae in Gagné (1981). The additional couplet and changes that follow will serve to key this genus. Change couplet 91 to 91a; on the last line of that couplet change 92 to 91b. Add the following new couplet 91b:

91b. Male gonopod extremely narrow and elongate; gonocoxite more than twice length of aedeagus. Female cercus dorsoventrally flattened; points

- of lateral setulae on distal half of ovipositor directed dorsally .....  
..... *Meunieriella* Kieffer
- Male gonopod broad; gonocoxite not much longer than aedeagus. Female  
cercus cylindrical or bulbous; points of lateral setulae on distal half of  
ovipositor directed posteriorly ..... 92

Females of *M. aquilonia* deposit eggs on either the upper or lower epidermis, the latter apparently preferred. Of 34 mines examined where empty eggs were found, 25 had been deposited on the lower epidermis. The spot galls are circular to oval, usually measuring 2–3 mm in greatest diameter. Initially the spot is whitish, but gradually turns brown after the larva abandons the leaflet. Only one gall was found per leaflet in all but two of 51 leaflets examined and only one larva was found in every gall, except in one that contained two. The pupal period for two flies reared from field-collected larvae lasted 10 days for one, 11 for the other.

This gall midge appears to be widespread in central Pennsylvania. It was collected on wild honeylocust in Dauphin Co.; at a garden center in Lancaster Co.; in nurseries in Centre, Columbia, and York counties; and in a cemetery in Dauphin Co. where thornless cultivars of honeylocust were infested. The collection of larvae from late June through mid-September suggests the midge has several generations per year.

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LITERATURE CITED

English, L. L. and R. Snetsinger. 1957. The biology and control of *Eotetranychus miltidigituli* (Ewing), a spider mite of honeylocust. J. Econ. Entomol. 50: 784–788.

Felt, E. P. 1911. Hosts and galls of American gall midges. J. Econ. Entomol. 4: 451–475.

———. 1940. Plant Galls and Gall Makers. Comstock Publishing Co., Ithaca, N.Y. 364 pp.

Gagné, R. J. 1968. Fasc. 23. Family Cecidomyiidae, 62 pp. In A Catalogue of the Diptera of the Americas south of the United States. Sao Paulo, Brazil.

———. 1981. Cecidomyiidae, pp. 257–292. In McAlpine et al., eds. Manual of Nearctic Diptera. Vol. 1. Research Branch, Agriculture Canada. Monograph No. 27. vi and 674 pp.

Möhn, E. 1975. Gallmücken (Diptera, Itonididae) aus El Salvador. 8. Teil: Lasiopteridi. Stuttgart. Beitr. Naturk. (A)276: 1–101.

Schread, J. C. 1959. Pod gall of honey locust. Conn. Agr. Expt. Sta. Circ. 206: 1–4.

Webster, H. V. and R. A. St. George. 1947. Life history and control of the webworm, *Homadaula albizziae*. J. Econ. Entomol. 40: 546–553.

Wheeler, A. G., Jr. and T. J. Henry. 1976. Biology of the honeylocust plant bug, *Diaphnocoris chlorionis*, and other mirids associated with ornamental honeylocust. Ann. Entomol. Soc. Am. 69: 1095–1104.

Wünsch, A. 1979. Gallenerzeugende Insekten nordkolumbiens, speziell Asphondyliidi und Lasiopteridi (Diptera, Cecidomyiidae) aus dem Küstenbereich um Santa Marta. Offsetdruck Kap-penhöfer, Waiblingen. 238 pp.